What is claimed is:

1. An optical access network including a plurality of optical network units coupled to an optical line terminal in a ring topology, in which the optical network units are connected together in a series, the optical line terminal being connected to the first optical network unit in the series, the last optical network unit in the series being connected to the optical line terminal, and wherein the connections are via a protection switch, the protection switch comprising:

means for monitoring the connections from the optical network units to detect a loss of signal from an optical network unit, and

a plurality of switching elements, one for each optical network unit, responsive to the detection of loss of signal from the respective optical network unit to switch the respective optical network unit out of the series such that continuity of the ring topology is maintained.

2. The optical access network of claim **1**, wherein the plurality of switching elements are cross-bar switches arranged so that, when an optical network unit is switched out of the series, the connections to and from the optical network unit are connected together.

3. The optical access network of claim **1**, wherein the means for monitoring comprises a plurality of photodetectors, each photodetector being arranged to detect signals on the connection from a respective optical network unit.

4. The optical access network of claim **3**, wherein each photodetector is arranged to control its respective switching element directly.

5. The optical access network of claim **3**, wherein the protection switch further comprises a controller coupled to the photodetectors, the controller being adapted for controlling the plurality of switching elements.

6. The optical access network of claim **1**, the protection switch further comprising a controller arranged to control the plurality of switching elements, wherein the means for monitoring comprises a photodetector connected to the controller and arranged to monitor optical signals in the ring, the controller being arranged to toggle at least one of the plurality of switching elements in the event of a loss of signal in the ring to identify a faulty connection.

7. The optical access network of claim **1**, wherein the means for monitoring comprises a controller arranged to control the plurality of switching elements, the controller including:

a first receiver coupled to the optical line terminal for receiving downstream optical signals from the optical line terminal;

a first transmitter for re-transmitting the downstream optical signals to the first optical network unit in the series;

a second receiver for receiving upstream optical signals from the last optical network unit in the series;

a second transmitter for re-transmitting the upstream optical signals to the optical line terminal; and

a processor arranged to control the switching elements, the processor being arranged to toggle at least one of the plurality of switching elements in the event of a loss of signal in the ring to identify a faulty connection.

8. The optical access network of claim **7**, wherein the processor is further arranged to detect malicious or unauthorized usage of an optical network unit and to cause at least one of the plurality of switching elements to switch the optical network unit subject to such usage out of the series.

9. The optical access network of claim **7**, wherein the processor is further arranged to process the upstream and downstream optical signals prior to re-transmission, and wherein the processing includes implementing at least one of a ring protocol and encryption.

10. A protection switch for an optical access network comprising a plurality of optical network units connected to an optical line terminal in a ring topology in which the optical network units are connected together in a series, the optical line terminal being connected to the first optical network unit in the series, and the last optical network unit in the series being connected to the optical line terminal, and wherein the connections are via the protection switch, the protection switch comprising:

at least one signal monitor for monitoring the connections from the optical network units to detect a loss of signal from an optical network unit, and

a plurality of switches, one for each optical network unit, responsive to the detection of loss of signal from the respective optical network unit to switch the respective optical network unit out of the series such that continuity of the ring topology is maintained.

11. The protection switch of claim **10**, wherein each of the plurality of switches are cross-bar switches arranged so that, when an optical network unit is switched out of the series, the connections to and from the optical network unit are connected together.

12. The protection switch of claim **10**, wherein the at least one signal monitor comprises a plurality of photodetectors, each photodetector being arranged to detect signals on the connection from a respective optical network unit.

13. The protection switch of claim **12**, wherein each photodetector is arranged to control its respective switching means directly.

14. The protection switch of claim **12**, further comprising a controller, the controller being coupled to the photodetectors and being adapted for controlling the plurality of switches.

15. The protection switch of claim **10**, further comprising a controller arranged to control the plurality of switches, wherein the at least one signal monitor comprises a

photodetector connected to the controller and arranged to monitor optical signals in the ring, the controller being arranged to toggle at least one of the plurality of switches in the event of a loss of signal in the ring to identify a faulty connection.

16. The protection switch of claim **10**, wherein the at least one signal monitor comprises a controller arranged to control the plurality of switches, the controller including:

means for receiving downstream optical signals from the optical line terminal;

means for re-transmitting said downstream signals to the first optical network unit in the series;

means for receiving upstream optical signals from the last optical network unit in the series;

means for re-transmitting said upstream optical signals to the optical line terminal; and

a processor arranged to control the plurality of switches, the processor being arranged to toggle at least one of the plurality of switches in the event of a loss of signal in the ring to identify a faulty connection.

17. The protection switch of claim **16**, wherein the processor is further arranged to detect malicious or unauthorized usage of an optical network unit and to cause at least one of the plurality of switches to switch the optical network unit subject to such usage out of the series.

18. The protection switch of claim **16**, wherein the processor is further arranged to process the upstream and downstream optical signals prior to re-transmission, and wherein the processing includes implementing at least one of a ring protocol and encryption.

19. A method for protecting an optical access network comprising a plurality of optical network units connected to an optical line terminal in a ring topology, in which the optical network units are connected together in a series, the optical line terminal

being connected to the first optical network unit in the series, and the last optical network unit in the series being connected to the optical line terminal, and wherein the connections are via a protection switch, the method comprising:

monitoring the connections from the optical network units to detect a loss of signal from an optical network unit; and

responsive to the detection of loss of signal from an optical network unit, switching the optical network unit out of the series such that continuity of the ring topology is maintained.

20. The method of claim **19**, further comprising, when an optical network unit is switched out of the series, connecting together the connections to and from that optical network unit.

21. The method of claim **19**, further comprising:

monitoring optical signals in the ring to detect loss of signal in the ring; and

toggling switches in the protection switch in the event of a loss of signal in the ring to identify a faulty connection.

22. The method of claim **21**, further comprising:

monitoring optical signals in the ring to detect malicious or unauthorized usage of an optical network unit; and

responsive to the detection of malicious or unauthorized usage, switching the optical network unit subject to such usage out of the series.